West Valley Water District

2022

Public Health Goal Report

Report Prepared by

West Valley Water District

INTRODUCTION

Background

Under the Calderon-Sher Safe Drinking Water Act of 1996 (the Act), public water systems with more than 10,000 service connections are required to prepare a report every three years for contaminants that exceed their respective Public Health Goals (PHG). This document contains health risk information on regulated drinking water contaminants to assist public water systems in preparing these reports. A PHG is the concentration of a contaminant in drinking water that poses no significant health risk if consumed for a lifetime. PHGs are developed and published by the office of Environmental Health Hazard Assessment (OEHHA) using current risk assessment principles, practices, and methods.

The purpose of the PHG Report, as stated in Health and Safety Code (HSC) §116470, is to:

1. Identify each contaminant detected that exceeds the established PHG.
2. Disclose the numerical public health risk associated with contaminant levels associated with the maximum contaminant level (MCL) and PHG. Numerical public health risks are determined by OEHHA (HSC §116365).
3. Identify the category of risk to public health associated with exposure to the contaminant in drinking water.
4. Describe the best available technology (BAT), if commercially available, that could remove or reduce contaminants that exceeded the PHGs.
5. Provide an estimated total cost and cost per customer for implementing the best available technology to reduce the contaminant concentration at a level equal to or below the PHG.
6. Describe the action that will be taken by the water system to reduce the contaminant concentration, if any, and the reasoning for that decision.

West Valley Water District (WVWD) has prepared the 2022 PHG Report to comply with the requirements of HSC §116470. Only contaminants that have a primary drinking water standard (PDWS) MCL, were detected at levels above the detection limit for purposes of reporting (DLR) requirements are included in this report.

WHAT ARE PHGs?

California drinking water standards are established by the USEPA and State Water Resources Control Board's Division of Drinking Water (DDW). MCLs are the highest level of contaminants allowed in drinking water. PDWS MCLs are set as close to PHGs or MCLGs as economically and technologically feasible and are set for contaminants that affect health. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

In comparison, PHGs are set by OEHHA and are based solely on health-risk considerations. None of the practical risk-management factors that are considered by the USEPA and DDW in setting the MCLs are

considered in setting the PHGs. Risk-management factors used in setting MCLs include analytical detection capabilities, available treatment technologies, benefits, and costs. PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

Water Quality Data Considered

For the 2022 PHG Report, WVWD has considered and evaluated all water quality data from 2019 to 2021. Summaries of this data can be viewed in the 2019, 2020, and 2021 Water Quality Reports which were made available to all WVWD customers. Water Quality Reports can be viewed at WVWD's website through the following link https://wvwd.org/about/transparency/.

Guidelines Followed

The Association of California Water Agencies (ACWA) formed a workgroup, which prepared guidelines for water utilities to use in preparing PHG reports. ACWA's April 2022 Public Health Goals Report Guidance document was used in preparation of this report. No guidance was available from state regulatory agencies.

Best Available Treatment Technology and Cost Estimates

Both the USEPA and DDW adopt Best Available Technologies (BATs), which are the best-known methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible or feasible to determine what treatment is needed to further reduce a constituent down to or near the PHG or MCLG, many of which are set at zero. Estimating the costs to reduce a constituent to zero is difficult, if not impossible, because it is not possible to verify by analytical means that the level has been lowered to zero. This is because the DLRs for contaminants can be greater than the PHG or MCLG, meaning that detecting levels of contaminants at concentrations equal to the PHG, MCLG, or to a level of zero is not practical. In some cases, installing treatment to try and further reduce very low levels of one constituent may have adverse effects on other aspects of water quality.

Please note, all cost estimates provided in this report are highly speculative and theoretical, and actual costs can be far greater. Estimated costs include annualized capital, operations, and maintenance costs. AWWA's Cost Estimates for Treatment Technologies were used to determine the estimated costs. All costs were estimated based on average water productions from 2019 to 2021 for each of the sources that exceeded the PHG or MCLG.

Constituents Detected that Exceed a PHG or MCLG

The following is a discussion of contaminants that were detected in one or more of our drinking water sources at levels above the PHG or MCLG.

Inorganic Contaminants

Arsenic

The source of arsenic in water supplies is mainly from erosion of natural deposits, runoff from orchards, and glass and electronic production wastes. The PHG for arsenic is 0.004 µg/L and the MCL is 10 µg/L. Arsenic has been detected at levels above the PHG in 7 of 18 of WVWD's groundwater wells between 2019 and 2021. Detected levels of arsenic were below the MCL at all times. WVWD is in full compliance with arsenic drinking water standards. The maximum arsenic concentrations for the wells were as follows:

1. Well 1A – 4.5 µg/L
2. Well 2 (Treated) – 5.9 µg/L
3. Well 4A – 8.9 µg/L
4. Well 5 – 3.9 µg/L
5. Well 7 – 5.7 µg/L
6. Well 8A – 4.8 µg/L
7. Well 15 – 2.2 µg/L

Category of Health Risk
The category of health risk associated with arsenic and the reason that a drinking water standard was adopted for it is that some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage or circulatory system problems and may have an increased risk of getting cancer (CCR, Title 22, Appendix 64465-D).

Numerical Health Risk
The numerical health risk for arsenic at the PHG of 0.004 µg/L is one excess cancer case per mission people over a lifetime of exposure. The numerical health risk for arsenic at the MCL of 10 µg/L is 2.5 excess cancer cases per 1,000 people over a lifetime of exposure.

BATs and Estimated Cost
Based on CCR, Title 22, Table 64447.2-A – BATs for lowering arsenic below the PHG are:

- Activated Alumina
- Blending
- Coagulation/Flocculation
- Electrodialysis
- Ion Exchange
- Oxidation/Filtration
- Reverse Osmosis

Since arsenic concentrations are already below the MCL, implementing BAT is not required. The estimated cost to install and operate BATs for reducing arsenic concentrations below the PHG range from an annual cost of $1,742,695.81 to $3,756,477.63. The annual cost per service connection, or per customer, would range from $73.86 to $159.22.

Lead

The source of lead in water supplies is mainly from internal corrosion of household water plumbing systems, discharges from industrial manufacturers, and erosion of natural deposits. The PHG for lead is 0.2 µg/L and the MCL has an Action Level (AL) of 15 µg/L. The AL is the level of concentration of a harmful or toxic substance or contaminant that, when exceeded, is considered sufficient to warrant regulatory or remedial action. Lead has been detected in 2 of 18 of WVWD's groundwater wells between 2019 and 2021. Detected levels of lead were below the MCL at all times. WVWD is in full compliance with lead drinking water standards. The maximum lead concentrations for the wells are as follows:

- Well 24 – 0.51 µg/L
- Well 41 – 2.0 µg/L

Category of Health Risk

The category of health risk associated with lead and the reason a drinking water standard was adopted for it is that infants and children who drink water containing lead in excess of the action level may experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities. Adults who drink this water over many years may develop kidney problems or high blood pressure (22 CCR, Appendix 64465-D).

Numerical Health Risk

The numerical health risk for lead at the PHG of 0.2 µg/L is less than one in one million adults over a lifetime of exposure. The numerical health risk for lead at the AL of 15 µg/L is two cases per one million adults over a lifetime of exposure. There are no available numerical health risks factors for the effects on infants or children.

BATs and Estimated Cost

While not precisely stated in the regulations, the best available technology for lead is optimized corrosion control (ACWA's April 2022 PHG Report Guidance) until lead plumbing can be replaced. West Valley Water District already monitors the corrosivity of the water we provide to our customers and optimizes corrosion control.

Since lead concentrations are already below the MCL, implementing BAT is not required. The estimated cost to install and operate BATs for reducing lead concentrations below the PHG has an annual cost of approximately $44,182.95. The annual cost per service connection, or per customer, would be approximately $1.87. to $114.18.

Nickel

The source of nickel in water supplies is mainly from erosion of natural deposits and discharge from metal factories. The PHG for nickel is 12 µg/L and the MCL is 100 µg/L. Nickel has been detected at levels above the PHG in 3 of 18 of WVWD's groundwater wells and in one well that is part of the Baseline Feeder system, which WVWD operates, between 2019 and 2021. Detected levels of nickel were below the MCL at all times. WVWD is in full compliance with nickel drinking water standards. The maximum nickel concentrations for the wells are as follows:

- Well 7 – 18 µg/L
- Well 42 – 23 µg/L
- 9th Street North Well – 19 µg/L

Category of Health Risk

The category of health risk associated with nickel and the reason that a drinking water standard was adopted is that for it is that some people who drink water containing nickel in excess of the MCL over many years may experience liver and heart effects (22 CCR, Appendix 64465-D).

Numerical Health Risk

Not Applicable.

BATs and Estimated Cost

Based on CCR, Title 22, Table 6447.2-A – BATs for lowering nickel below the PHG are:

- Ion exchange
- Reverse osmosis

Since Nickel concentrations are already below the MCL, implementing BAT is not required. The estimated cost to install and operate the BATs for reducing arsenic concentrations below the PHG range from an annual cost of $2,228,943.96 to $3,179,523.00. The annual cost per service connection, or per customer, would range from $94.47 to $134.77.

Perchlorate

Perchlorate is an inorganic chemical used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store or dispose of perchlorate and its salts. The PHG for perchlorate is 1 µg/L and the MCL is 6 µg/L. Perchlorate has been detected at levels above the PHG in 3 of 18 WVWD's groundwater wells between 2019 and 2022. Detected levels of perchlorate were below the MCL at all times. WVWD is in full compliance with perchlorate drinking water standards. The maximum perchlorate levels for the wells are as follows:

- Well 15 – 2 µg/L
- Well 33 – 4.2 µg/L
- Well 41 (Treated) – 2.2 µg/L

Category of Health Risk

Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse effects associated with inadequate hormone levels. Thyroid hormones are needed for normal growth and development in the infant and child. In

adults, thyroid hormones are needed for normal metabolism and mental function (22 CCR, Appendix 64465-D).

Numerical Health Risk

Not Applicable.

BAT and Estimated Cost

Based on CCR, Title 22, Table 6447.2-A – BATs for lowering perchlorate below the PHG are:

- Ion exchange
- Biological Fluidized Bed Reactor

WVWD provides Ion Exchange for the removal of perchlorate for Well 41. In addition, Well 33 has the ability to be treated through WVWD's Fluidized Bed Reactor (FBR) groundwater treatment plant for the removal of perchlorate. The estimated cost for additional treatment for reducing perchlorate concentrations below the PHG range from an annual cost of $674,046.78 to $2,111,352.40. The annual cost per service connection, or per customer would range from $28.57 to $89.49.

Volatile Organic Compound Contaminants

Tetrachloroethylene (PCE)

The source of PCE in water supplies is mainly from discharge from factories, dry cleaners and auto shops (metal degreaser). The PHG for PCE is 0.06 µg/L and the MCL is 5 µg/L. PCE has been detected at levels above the PHG in 5 out of 18 WVWD's groundwater wells and two wells that are part of the Baseline Feeder system, which WVWD operates, between 2019 and 2021. Detected levels of PCE were below the MCL at all times. WVWD is in full compliance with PCE drinking water standards. The maximum PCE levels for the wells are as follows:

- Well 15 – 0.51 µg/L
- Well 17 – 1.2 µg/L
- Well 42 – 0.80 µg/L
- 9th Street North – 0.69 µg/L
- 9th Street South – 0.82 µg/L

Category of Health Risk

The category of health risk associated with PCE and the reason that a drinking water standard was adopted for it is that some people who drink water containing Tetrachloroethylene in excess of the MCL over many years may experience liver problems and have an increased risk of getting cancer. (22 CCR, Appendix 64465-E).

Numerical Health Risk

The numerical health risk for PCE at the PHG of 0.06 µg/L is one excess cancer case per million people over a lifetime of exposure. The numerical health risk for PCE at the MCL of 5 µg/L is eight excess cancer cases per one hundred thousand people over a lifetime of exposure.

BATs and Estimated Cost

Based on CCR, Title 22, Table 64447.4-A – BATs for lowering PCE below the PHG are:

- Granular activated carbon (GAC)
- Packed tower aeration

Since PCE concentrations are already below the MCL, implementing BAT is not required. The estimated cost to install and operate the BATs for reducing PCE concentrations below the PHG range from an annual cost of $2,427,494.60 to $2,655,072.22. The annual cost per service connection, or per customer, would range from $102.89 to $112.54.

Radiological Contaminants

Gross Alpha Particle Activity

The source of gross alpha particle activity in water supplies is mainly from the erosion of natural deposits. A PHG for gross alpha particles has not been established. The MCLG for gross alpha particles is 0 pCi/L and the MCL is 15 pCi/L. Gross alpha particles have been detected above the MCLG between 2019 and 2021 in 5 of 18 WVWD's groundwater wells and one well that are a part of the Baseline Feeder system, which WVWD operates. Detected levels of gross alpha particles were below the MCL at all times. WVWD is in full compliance with gross alpha particle drinking water standards. The maximum gross alpha particle concentrations for the wells were as follows:

- Well 1A – 4.8 pCi/L
- Well 7 – 3.9 pCi/L
- Well 15 – 4.7 pCi/L
- Well 30 – 3.3 pCi/L
- Well 33 – 3.1 pCi/L
- 9th Street South – 3.5 pCi/L

Category of Health Risk

The category of health risk associated with gross alpha particles and the reason that a drinking water standard was adopted for it is that some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer (22 CCR, Appendix 64465-C).

Numerical Health Risk

The numerical health risk for gross alpha particles at the MCLG of 0 pCi/L is zero. The numerical health risk for gross alpha particles at the MCL of 15 pCi/L is one excess cancer case per one thousand people over a lifetime of exposure.

BAT and Estimated Cost

Based on CCR, Title 22, Table 6447.3-A – BAT for lowering gross alpha particle activity below the PHG is reverse osmosis. Since gross alpha particle activity are already below the MCL, implementing BAT is not required. The estimated cost to install and operate the BAT for reducing gross alpha particle activity concentrations below the PHG range from an annual cost of $12,415,946.16 to $21,755,869.63. The annual cost per service connection, or per customer, would range from $526.26 to $922.13.

RADIUM 226

The source of Radium 226 in water supplies is mainly from the erosion of natural deposits. A PHG for Radium 226 is 0.05 pCi/L and the MCL is 5 pCi/L (combined $Ra^{226+228}$). Radium 226 has been detected above the PHG between 2019 and 2021 in 1 of 18 WVWD's groundwater wells. Detected levels of Radium 226 were below the MCL at all times. WVWD is in full compliance with Radium 226 drinking water standards. Radium 226 was detected in Well 33 at a maximum concentration of 1.3 pCi/L.

Category of Health Risk

The category of health risk associated with Radium 226 and the reason that a drinking water standard was adopted for it is that some people who drink water containing Radium 226 in excess of the MCL over many years may have an increased risk of getting cancer (22 CCR, Appendix 64465-C).

Numerical Health Risk

The numerical health risk for Radium 226 at the PHG of 0.05 pCi/L is one excess cancer case per one million people over a lifetime of exposure. The numerical health risk for Radium 226 at the MCL of 5 pCi/L is one excess cancer case per ten thousand people over a lifetime of exposure.

BAT and Estimated Cost

Based on CCR, Title 22, Table 6447.3-A – BAT for lowering Radium-226 below the PHG are:

- Ion exchange
- Reverse osmosis
- Lime softening

Since Radium-226 is already below the MCL, implementing BAT is not required. The estimated cost to install and operate the BAT for reducing gross alpha particle activity concentrations below the PHG range from an annual cost of $429,415.42 to $752,444.13. The annual cost per service connection, or per customer, would range from $18.320 to $31.89.

RADIUM 228

The source of Radium 228 in water supplies is mainly from the erosion of natural deposits. A PHG for Radium 228 is 0.019 pCi/L and the MCL is 5 pCi/L (combined $Ra^{226+228}$). Radium 228 has been detected above the PHG between 2019 and 2021 in 4 of 18 WVWD's groundwater wells. Detected levels of Radium 228 were below the MCL at all times. WVWD is in full compliance with Radium 228 drinking water standards. The maximum Radium 228 concentrations for the wells were as follows:

- Well 7 – 1.8 pCi/L
- Well 11 – 1.4 pCi/L
- Well 15 – 1.5 pCi/L
- Well 33 – 1.4 pCi/L

Category of Health Risk

The category of health risk associated with Radium 228 and the reason that a drinking water standard was adopted for it is that some people who drink water containing Radium 228 in excess of the MCL over many years may have an increased risk of getting cancer (22 CCR, Appendix 64465-C).

Numerical Health Risk

The numerical health risk for Radium 228 at the PHG of 0.019 pCi/L is one excess cancer case per one million people over a lifetime of exposure. The numerical health risk for Radium 228 at the MCL of 5 pCi/L (combined $Ra^{226+228}$) is three excess cancer cases per ten thousand people over a lifetime of exposure.

BAT and Estimated Cost

Based on CCR, Title 22, Table 64447.3-A – BAT for lowering Radium 228 below the PHG are:

- Ion exchange
- Reverse osmosis
- Lime softening

Since Radium 228 is already below the MCL, implementing BAT is not required. The estimated cost to install and operate the BAT for reducing Radium 228 concentrations below the PHG range from an annual cost of $2,469,718.80 to $4,327,570.32. The annual cost per service connection, or per customer, would range from $104.68 to $183.43.

URANIUM

The source of uranium in water supplies is mainly from the erosion of natural deposits. The PHG for uranium is 0.43 pCi/L and the MCL is 20 pCi/L. Uranium has been detected at levels above the PHG between 2019 and 2021 in 12 of 18 WVWD's groundwater wells. Detected levels of uranium were below the MCL at all times. WVWD is in full compliance with uranium drinking water standards. The uranium concentrations for the wells were as follows:

- Well 1A – 4.9 pCi/L
- Well 4A – 2.5 pCi/L
- Well 5A – 2.4 pCi/L
- Well 7 – 1.7 pCi/L
- Well 8A – 1.9 pCi/L
- Well 11 – 3.0 pCi/L
- Well 15 – 4.5 pCi/L
- Well 24 – 2.8 pCi/L

- Well 30 – 3.1 pCi/L
- Well 33 – 2.6 pCi/L
- Well 41 – 2.0 pCi/L
- Well 42 0 3.2 pCi/L

Category of Health Risk

The category of health risk with uranium and the reason that a drinking water standard was adopted for it is that some people who drink water containing uranium in excess of the MCL over many years may have kidney problems or an increased risk of getting cancer (22 CCR, Table 64465-C).

Numerical Health Risk

The numerical health risk for uranium at the PHG of 0.43 pCi/L is one excess cancer case per million people over a lifetime of exposure. The numerical health risk for uranium at the MCL of 20 pCi/L is five excess cancer cases per one hundred thousand people over a lifetime of exposure.

BAT and Estimated Cost

Based on CCR, Title 22, Table 64447.3-A – BAT for lowering uranium below the PHG is reverse osmosis. Other BATs exist, however, since some of the same wells have gross alpha particle activity above the PHG, and only reverse osmosis is listed as a BAT for gross alpha particles, no other BATs were considered. Uranium concentrations are already below the MCL, so implementing BAT is not required. The estimated cost to install and operate the BAT for reducing uranium concentrations below the PHG range from an annual cost of $13,615,133.48 to $23,857,148.31. The annual cost per service connection, or per customer would range from $577.08 to $1,011.20.

RECOMMENDATIONS FOR FURTHER ACTION

The drinking water quality of West Valley Water District meets all State of California, DDW and USEPA Drinking Water Standards set to protect public health. To further reduce the levels of the constituents identified in this report that are already significantly below the health-based Maximum Contaminant Levels established to provide “safe drinking water”, additional costly treatment processes would be required. The effectiveness of the treatment process to provide any significant reductions in constituent levels at these already low values is uncertain. The health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. The money that would be required for these additional treatment processes might provide greater public health protection benefits if spent on other water system operations, surveillance, and monitoring programs. Therefore, no action is proposed, except to continue meeting all State of California, DDW and USEPA Drinking Water Standards set forth to protect public health.